UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/540,550	06/24/2005	Shinichi Kobayashi	017700-0176	7156

23392 7590 03/02/2011

FOLEY & LARDNER
555 South Flower Street
SUITE 3500
LOS ANGELES, CA 90071-2411

EXAMINER
TSCHEN, FRANCISCO W

ART UNIT	PAPER NUMBER
1714	

MAIL DATE	DELIVERY MODE
03/02/2011	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/540,550	KOBAYASHI ET AL.	
	Examiner	Art Unit	
	FRANCISCO TSCHEN	1714	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 September 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-13,15-20 and 23-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-13,15-20 and 23-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 September 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *9/16/2010*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9/16/2010 has been entered.

Claim Objections

2. Claim 15 is objected to because of the following informalities: Claim 15 apparently should depend on Claim 13 not Claim 1, based on preamble of Claim 15. Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1,3,4,8,9,11-13,15,16,19,20,23-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi et al. (US Patent 6,632,776 B2, hereafter US'776) in view of Kobayashi et al. (International Application WO/2003/100795, hereafter WO'795; US Patent 6,993,823 B2 is used as the literal translation, all citations made, are in reference to US Patent 6,993,823 B2)

Re Claims 1,3,11-13,15,19,20,23-25,27, 28-30: US'776 teaches method for manufacturing an oxide superconducting wire by coating raw material powder of an oxide superconductor with a metal, heat treating the wire in a pressurized atmosphere (Abstract). US'776 teaches that the heat treatment is done at a total pressure of at least 0.5MPa to suppress any expansion caused by the gas produced by the powder (col.4

lines 6-12). US'776 teaches that the heat treatment was done with total pressures that ranged from 0.1MPa-20MPa (Table 1). The increase of the pressurized atmosphere total pressure during heat treatment improves the critical current of the wire (col. 8, lines 52-54).

US'776 teaches that the pressurization can be done before temperature increase, during temperature increase **(heat-up)** / reduction and/or during heat treatment (Table 2, Column: Pressurization Starting Condition (Temperature)). US'766 teaches that the heat treatment temperature is achieved at temperatures ranging from 795C to 840C (Table 2, Table 3; Column: Heat Treatment Temperature (C)). The metal utilized is silver or a silver alloy (col.6 lines 8-10).

Based on the instant specification, it is to be understood that the 0.2% yield strength of the metal, in this case silver is below 50MPa (which is the applicants maximum total pressure) at a temperature above 400C (Figure 13).

As mentioned previously, US'766 teaches that the pressurization step can start when the temperature is increasing (**heat-up**) as is the case of sample 19 (Table 2). In this case, the temperature is 500C in which the 0.2% yield strength of the metal is below 50MPa before reaching the desired heat treatment of 840C.

US'776 fails to teach that the pressurization of the atmosphere is continuously increased for the duration of the heat treatment at a speed of at least 0.05MPa/min.

However, WO'795 teaches a method for manufacturing oxide superconducting wire in which the total pressure of the atmosphere is controlled to increase at a rate of at least 0.05MPa/min in the heat-up time before the heat treatment; during the heat

treatment, the pressure in the atmosphere is controlled to continuously increase as well. (col.15 lines 33-39). This increase in pressure suppresses the formation of voids and blisters in the wire (col. 15 lines 25-29).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of US'776 and continuously increase the pressure of the atmosphere at a rate of at least 0.05MPa/min for the duration of the heat treatment as taught in WO'795 to suppress the formation of blisters and voids in the wire.

Re Claim 3: The combined teaching of US'766/WO'795 teaches that when the pressure of the atmosphere is controlled to continuously increase at the speed of at least 0.05MPa/min a compressive force is applied to the wire which prevents the formation of voids and blisters (WO'795 col.6 lines 40-48). The combined teaching of US'776/WO'795 is silent regarding the speed of said pressurization is at least 0.1MPa/min.

However, it is recognized in the art that the speed of pressurization is a result effective parameter since it prevents formation of voids and blisters in the wire.

Where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. See MPEP 2144.05.

Re Claim 4: US'776 teaches that the oxide superconductor can be stably generated when the oxygen partial pressure in the pressurized atmosphere is kept at 0.003-0.02MPa (col.5 lines 50-55).

Re Claim 8: US'776 teaches that the wires made with an oxide superconductor such as Bi-2223 which are superposed with each other through a clearance member of ceramic paper made of alumina fiber and zirconia powder (col. 8 lines 1-11).

Re Claim 9: US'776 teaches that resulting wires are superposed with each other through a clearance member of ceramic paper and wound on a spool of stainless alloy prior to heat treatment (col. 8 lines 1-11).

Re Claim 16: US'776 teaches that the oxide superconductor can be stably generated when the oxygen partial pressure in the pressurized atmosphere is kept at 0.003-0.02MPa (col.5 lines 50-55).

Re Claim 26: US'776 teaches that the total pressure of system is pressurized to at least 0.5MPa, this allows the wire to be inhibited from expansion caused by gas generated in the raw material powder for the oxide superconductor present in the wire (col.4 lines 6-12). In addition, as explained in the instant specification: the pressurization of the atmosphere acts as a compressive force similar to hot working, the wire is

compressed before pressurizing gas penetrates into the wire through pinholes (Instant Specification [0018]).

7. Claims 5, 6, 7,17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi et al. (US Patent 6,632,776 B2, hereafter US'776) in view of Kobayashi et al. (International Application WO/2003/100795, hereafter WO'795; US Patent 6,993,823 B2 is used as the literal translation, all citations made, are in reference to US Patent 6,993,823 B2) and further in view of Snitchler et al. (US Patent 6,393,690 B1, hereafter US'690).

8. Re Claim 5, 17: US'776 teaches that the raw material powder for a Bi oxide superconductor includes a 2223 phase (col.1 lines 62-67). US'776 is silent regarding said wire is annealed in an oxygen-containing atmosphere of a temperature of at least 300C and not more than 600C in said heat treatment.

However, US'690 teaches that in the manufacture of superconductive composite articles comprising BSCCO 2223 precursors (col. 14 lines 1-8), it is known to perform wire annealing in an oxydizing atmosphere at temperature less than 550C (col. 14 lines 35-41). This promotes oxidizing decoupling layers which are in contact with the BSCCO 2223 precursors (Fig 1). The use of decoupling layers enables the fabrication of multi-filament conducting composite articles which are known to improve AC loss characteristics and high critical current densities. (col.2 line 66 – col. 3 line 3).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of US'690 and include decoupling layers in

contact with the BSCCO 223 precursors and anneal them in an oxygen atmosphere so that they would oxidize as taught in US'776, since it is known to improve AC loss characteristics and high critical current densities.

Re Claim 6: US'776 is silent regarding the method of manufacturing an oxide superconducting wire according to claim 1, further comprising a step of twisting said wire in advance of said heat treatment step.

However, US'690 teaches a method of manufacturing superconducting oxide composite articles which include twisted filaments of desired superconducting oxide material (Abstract). US'690 teaches that the superconducting wires are bundled together around a central rod (col.15 lines 9-10) twisted to 3 twists per inch using a hand drill and rolled into a final thickness of 0.010inch; the resulting wires are annealed (**heat treated**) (col.16 lines 28-36). This allows for the production of a wire having the desired number of filaments, such as needed in AC applications (col.11 lines 5-10).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of US'776 by including a step of twisting said wire in advance of the heat treating step to allow for a production of wire having desired number of filaments and thickness such as needed in AC applications.

Re Claim 7: US'776 is silent regarding manufacturing an oxide superconducting wire according to Claim 1, wherein said wire is not rolled.

However US'690 teaches that the production of an oxide superconductor may be manufactured by processes such as tape casting, dip coating, sputtering, and vapor deposition (col. 10 lines 17-26). The examiner equates these processes as processes that do not requiring rolling.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of US'776 with processes such as as tape casting, dip coating, sputtering, and vapor deposition as taught in US'690 that do not requiring rolling to produce an oxide superconducting wire with a reasonable expectation of success.

9. Claims 10,18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi et al. (US Patent 6,632,776 B2, hereafter US'776) in view of Kobayashi et al. (International Application WO/2003/100795, hereafter WO'795; US Patent 6,993,823 B2 is used as the literal translation, all citations made, are in reference to US Patent 6,993,823 B2) and further in view of Sato et al. (US Patent 5,288,699 hereafter US'699).

The combined teaching of US'776/US'690 is silent regarding said wire is held under a decompressed atmosphere before said pressurization in said heat treatment is started.

However, US'699 teaches that it is possible to produce an oxide superconductor of Bi2223 in a metal sheath (wire) heated under a reduced pressure. This prevents gas generation from the powder during heat treatment for further growing superconductive

particles, thereby preventing the superconducting wire from inflation such as caused by gas generation.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the combined teaching of US'776/US'690 by heat treating under a reduced pressure to prevent wire from inflation caused by gas generation.

Double Patenting

10. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory

double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

11. Claims 1, 4, 11, 12, 13, 16, 19, 20, 25, 27-30 are rejected on the ground of nonstatutory double patenting over claims 1, 4, 18 of U. S. Patent No. 6,993,823.

US'823 discloses a method of manufacturing an oxide superconducting wire, comprising: a step of preparing a wire formed by covering raw material powder of an oxide superconductor with a metal; and a step of heat-treating said wire in a pressurized atmosphere, wherein the total pressure of said pressurized atmosphere is at least 1 MPa and less than 50 MPa: and controlling the total pressure in the atmosphere to increase at a speed of at least 0.05 MPa/min at a heat-up time before the heat treatment in said heat-treating step. US'823 discloses that in "the method of manufacturing an oxide superconducting wire, said heat-treating step is carried out in an oxygen atmosphere, with a partial oxygen pressure of at least 0.003 MPa and not more than 0.02 MPa. US'823 discloses that in the method of manufacturing an oxide superconducting wire, the total pressure in said atmosphere to continuously increase in the heat treatment in said heat-treating step.

The claim is silent as to "starting the pressurization step at a temperature reducing 0.2% yield strength of said metal".

However, 0.2% yield strength is merely a property of the metal and decreases as temperature increases. US'776 teaches that in the manufacturing of oxide superconducting wire, it is common to start pressurization at different temperatures such as: 29C, 500C, 800C, 840C (Table 2, Column 6).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of US'823 by starting the process at different temperatures thereby affecting the 0.2% yield strength with reasonable expectation of success.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to FRANCISCO TSCHEN whose telephone number is (571)270-3824. The examiner can normally be reached on Monday - Thursday 7:30-17:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Kornakov can be reached on (571)272-1303. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/F. T./
Examiner, Art Unit 1714
/Michael Kornakov/
Supervisory Patent Examiner, Art Unit 1714